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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/826,959	04/15/2004	James D. Ballew	064747.1015	1484

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EXAMINER

MEHRMANESH, ELMIRA

ART UNIT	PAPER NUMBER
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2113

NOTIFICATION DATE	DELIVERY MODE
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01/29/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTOmail3@bakerbotts.com
PTOmail4@bakerbotts.com

Office Action Summary

Application No.

10/826,959

Applicant(s)

BALLEW ET AL.

Examiner

Elmira Mehrmanesh

Art Unit

2113

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-11,14-21 and 24-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 31 is/are allowed.
- 6) ☒ Claim(s) 1,4-11,14-21 and 24-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

This action is in response to a RCE filed on October 31, 2007 for the application of Ballew et al., for a "System and method for detecting and managing HPC node failure" filed April 15, 2004.

Claims 1, 4-11, 14-21, 24-31 are pending in the application.

Claims 1, 4, 5, 9-11, 14-15, 17, 19-21, 24-25, and 27-30 have been amended.

Claims 2-3, 12-13, and 22-23 have been cancelled.

Claim 31 has been added.

Claims 1-30 are rejected under 35 USC § 103.

Claim 31 is allowable.

Claim Objections

Claim 31 is objected to because of the following informalities:

In claim 31, line 2, "node1s" should be changed to --nodes--.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang (U.S. Patent No. 5,748,882) in view of Karpoff (U.S. PGPub No. 20010049740).

As per claim 1, Huang discloses a method comprising:
determining that one of a plurality of nodes has failed (col. 5, lines 15-19)
removing the failed node from a virtual list of nodes, the virtual list comprising one logical entry for each of the plurality of nodes (col. 10, lines 45-50)
determining that at least a portion of a job was being executed on the failed node (col. 7, lines 49-55) and terminating at least the portion of the job (Fig. 5, element 511).
determining that the job was associated with a subset of the plurality of nodes; and deallocating the subset of nodes from the job (col. 7, lines 5-67 through col. 8, lines 1-9)

Huang discloses an integrated fabric (col. 4, lines 66-67 through col. 5, lines 1-2). Each node contains communication links, communication ports (col. 10, lines 65-67), (col. 11, lines 60-61), and the fault tolerance socket (col. 18, lines 28-31). However

Huang fails to explicitly disclose a switching fabric integrated onto a board and one or more processors.

Karpoff teaches:

each node comprising a switching fabric integrated onto a board and one or more processors integrated onto the board (FIG. 4A, a typical INFINIBAND® Architecture 20 includes **one or more Central Processing Units** (CPUs) 30, a Memory Controller 28, a Host Interconnect 29, a Host Channel Adapter (HCA) 22, a Target Channel Adapter (TCA) 24, and one or more Switches 26 (page 6, paragraph [0089]). Karpoff further discloses **nodes attached to the fabric** can be assembled into logical subsets or partitions in order to group hosts or devices with like attributes, much like zoning capabilities of Fiber Channel fabrics (page 6, paragraph [0087]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the method and system for providing multimedia information of Karpoff in combination with the method for fault-tolerant computing of Huang to effectively monitor a multi-node system.

One of ordinary skill in the art at the time of the invention would have been motivated to make the combination because Huang discloses an integrated fabric (col. 4, lines 66-67 through col. 5, lines 1-2) wherein each node contains communication links, communication ports (col. 10, lines 65-67), (col. 11, lines 60-61). Huang's figure 2 shows an example of a node, which has at least one processor (col. 4, lines 66-67

through col. 5, lines 1-2). Karpoff's figure 4A shows a switching fabric, which includes one or more Central Processing Units (page 6, paragraph [0089]).

As per claim 4, Huang discloses each entry of the virtual list comprising a node status and the method further comprising changing the status of each of the subset of nodes to "available" (col. 10, lines 50-56).

As per claim 5, Huang discloses determining dimensions of the terminated job based on one or more job parameters and an associated policy; dynamically allocating a second subset of the plurality of nodes to the terminated job based on the determined dimensions (col. 17, lines 1-21)

executing the terminated job on the allocated second subset (col. 7, lines 5-67 through col. 8, lines 1-9).

As per claim 6, Huang discloses the second subset comprising a substantially similar set of nodes to the first subset (Fig. 2).

As per claim 7, Huang discloses dynamically allocating the second subset comprises: determining an optimum subset of nodes from a topology of unallocated nodes; and allocating the optimum subset (col. 7, lines 5-67 through col. 8, lines 1-9).

As per claim 8, Huang discloses locating a replacement node for the failed node; and updating the logical entry of the failed node with information on the replacement node (col. 7, lines 5-67 through col. 8, lines 1-9).

As per claim 9, Huang discloses determining that one of the plurality of nodes has failed comprises determining that a repeating communication has not been received from the failed node (col. 17, lines 21-30).

As per claim 10, Huang discloses determining that one of the plurality of nodes has failed comprises determining through polling that one of the plurality of nodes has failed (col. 8, lines 43-63).

As per claim 11, Huang discloses software encoded in one or more computer-readable tangible media and when executed operable to:

determine that one of the plurality of nodes has failed (col. 5, lines 15-19)

remove the failed node from a virtual list of nodes, the virtual list comprising one logical entry for each of the plurality of nodes (col. 10, lines 45-50)

determine that at least a portion of a job was being executed on the failed node (col. 7, lines 49-55) and terminating at least a portion of the job (Fig. 5, element 511)

determine that the job was associated with a subset of the plurality of nodes; and deallocate the subset of nodes from the job (col. 7, lines 5-67 through col. 8, lines 1-9)

Huang discloses an integrated fabric (col. 4, lines 66-67 through col. 5, lines 1-2). Each node contains communication links, communication ports (col. 10, lines 65-67), (col. 11, lines 60-61), and the fault tolerance socket (col. 18, lines 28-31). However Huang fails to explicitly disclose a switching fabric integrated onto a board and one or more processors.

Karpoff teaches:

each node comprising a switching fabric integrated onto a board and one or more processors integrated onto the board (FIG. 4A, a typical INFINIBAND® Architecture 20 includes **one or more Central Processing Units (CPUs) 30**, a Memory Controller 28, a Host Interconnect 29, a Host Channel Adapter (HCA) 22, a Target Channel Adapter (TCA) 24, and one or more Switches 26 (page 6, paragraph [0089]). Karpoff further discloses **nodes attached to the fabric** can be assembled into logical subsets or partitions in order to group hosts or devices with like attributes, much like zoning capabilities of Fiber Channel fabrics (page 6, paragraph [0087]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the method and system for providing multimedia information of Karpoff in combination with the method for fault-tolerant computing of Huang to effectively monitor a multi-node system.

One of ordinary skill in the art at the time of the invention would have been motivated to make the combination because Huang discloses an integrated fabric (col. 4, lines 66-67 through col. 5, lines 1-2) wherein each node contains communication

links, communication ports (col. 10, lines 65-67), (col. 11, lines 60-61). Huang's figure 2 shows an example of a node, which has at least one processor (col. 4, lines 66-67 through col. 5, lines 1-2). Karpoff's figure 4A shows a switching fabric, which includes one or more Central Processing Units (page 6, paragraph [0089]).

As per claim 14, Huang discloses each entry of the virtual list comprising a node status and the software further operable to change the status of each of the subset of nodes to "available" (col. 10, lines 50-56).

As per claim 15, Huang discloses to determine dimensions of the terminated job based on one or more job parameters and an associated policy; dynamically allocate a second subset of the plurality of nodes to the terminated job based on the determined dimensions (col. 17, lines 1-21)

executing the terminated job on the allocated second subset (col. 7, lines 5-67 through col. 8, lines 1-9).

As per claim 16, Huang discloses the second subset comprising a substantially similar set of nodes to the first subset (Fig. 2).

As per claim 17, Huang discloses the software is operable to dynamically allocate the second subset comprises software operable to: determine an optimum subset of nodes from a topology of unallocated nodes; and allocate the optimum subset

(col. 7, lines 5-67 through col. 8, lines 1-9).

As per claim 18, Huang discloses to locate a replacement node for the failed node; and update the logical entry of the failed node with information on the replacement node (col. 7, lines 5-67 through col. 8, lines 1-9).

As per claim 19, Huang discloses the software being operable to determine that one of the plurality of nodes has failed comprises software operable to determine that a repeating communication has not been received from the failed node (col. 17, lines 21-30).

As per claim 20, Huang discloses the software being operable to determine that one of the plurality of nodes has failed comprises the software being operable to determine through polling that one of the plurality of nodes has failed (col. 8, lines 43-63).

As per claim 21, Huang discloses a system comprising:
a plurality of nodes (Fig. 2)
a management node (Fig. 2, element 104) operable to:
determine that one of the plurality of nodes has failed (col. 5, lines 15-19)
remove the failed node from a virtual list of nodes, the virtual list comprising one logical entry for each of the plurality of nodes (col. 10, lines 45-50)

determine that at least a portion of a job was being executed on the failed node (col. 7, lines 49-55) and terminating at least a portion of the job (Fig. 5, element 511)

determine that the job was associated with a subset of the plurality of nodes; and deallocate the subset of nodes from the job (col. 7, lines 5-67 through col. 8, lines 1-9)

Huang discloses an integrated fabric (col. 4, lines 66-67 through col. 5, lines 1-2). Each node contains communication links, communication ports (col. 10, lines 65-67), (col. 11, lines 60-61), and the fault tolerance socket (col. 18, lines 28-31). However Huang fails to explicitly disclose a switching fabric integrated onto a board and one or more processors.

Karpoff teaches:

each node comprising a switching fabric integrated onto a board and one or more processors integrated onto the board (FIG. 4A, a typical INFINIBAND® Architecture 20 includes **one or more Central Processing Units** (CPUs) 30, a Memory Controller 28, a Host Interconnect 29, a Host Channel Adapter (HCA) 22, a Target Channel Adapter (TCA) 24, and one or more Switches 26 (page 6, paragraph [0089]). Karpoff further discloses **nodes attached to the fabric** can be assembled into logical subsets or partitions in order to group hosts or devices with like attributes, much like zoning capabilities of Fiber Channel fabrics (page 6, paragraph [0087]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the method and system for providing multimedia information of Karpoff

in combination with the method for fault-tolerant computing of Huang to effectively monitor a multi-node system.

One of ordinary skill in the art at the time of the invention would have been motivated to make the combination because Huang discloses an integrated fabric (col. 4, lines 66-67 through col. 5, lines 1-2) wherein each node contains communication links, communication ports (col. 10, lines 65-67), (col. 11, lines 60-61). Huang's figure 2 shows an example of a node, which has at least one processor (col. 4, lines 66-67 through col. 5, lines 1-2). Karpoff's figure 4A shows a switching fabric, which includes one or more Central Processing Units (page 6, paragraph [0089]).

As per claim 24, Huang discloses each entry of the virtual list comprising a node status and the management node further operable to change the status of each of the subset of nodes to "available" (col. 10, lines 50-56).

As per claim 25, Huang discloses the management node being further operable to: determine dimensions of the terminated job based on one or more job parameters and an associated policy; dynamically allocate a second subset of the plurality of nodes to the terminated job based on the determined dimensions (col. 17, lines 1-21)

executing the terminated job on the allocated second subset (col. 7, lines 5-67 through col. 8, lines 1-9).

As per claim 26, Huang discloses the second subset comprising a substantially similar set of nodes to the first subset (Fig. 2).

As per claim 27, Huang discloses the management node being operable to dynamically allocate the second subset comprises the management node being operable to: determine an optimum subset of nodes from a topology of unallocated nodes; and allocate the optimum subset (col. 7, lines 5-67 through col. 8, lines 1-9).

As per claim 28, Huang discloses the management node being further operable to: locate a replacement node for the failed node; and update the logical entry of the failed node with information on the replacement node (col. 7, lines 5-67 through col. 8, lines 1-9).

As per claim 29, Huang discloses the management node being operable to determine that one of the plurality of nodes has failed comprises the management node operable to determine that a repeating communication has not been received from the failed node (col. 17, lines 21-30).

As per claim 30, Huang discloses the management node is operable to determine through polling one of the plurality of nodes has failed (col. 8, lines 43-63).

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance:

After a complete search of all the relevant prior art the examiner has determined the claims are in condition for allowance. The following limitations when viewed in combination with the remainder of the claim as a whole place this application in condition for allowance.

As per claim 31, the examiner finds the novel and non obvious feature of claim 31, when read as whole to be *the first switch operable to communicably couple the first processors to at least eight second motherboards each comprising at least two second processors integrated onto the second motherboard and a second switch integrated onto the second motherboard operable to communicably couple the second processors to the first motherboard and at least seven third motherboards each comprising at least two third processors integrated onto the third motherboards and a third switch integrated onto the third motherboards, the first processors operable to communicate with particular second processors on a particular second motherboard via the first switch and the second switch on the particular second motherboard, the first processors operable to communicate with particular third processors on a particular third motherboard via the first switch, a particular second switch on a particular second motherboard between the first motherboard and the particular third motherboard, and the third switch on the particular third motherboard.*

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

In view of the applicants amendments, claims 1-30 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Huang (U.S. Patent No. 5,748,882) in view of Karpoff (U.S. PGPub No. 20010049740). Newly added claim 31 is allowed. Refer to the corresponding section of the claim analysis for details.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elmira Mehrmanesh whose telephone number is (571) 272-5531. The examiner can normally be reached on 9-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert W. Beausoliel can be reached on (571) 272-3645. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic
Business Center (EBC) at 866-217-9197 (toll-free).



ROBERT BEAUSOLIEL
SUPERVISORY PATENT EXAMINER
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